The Challenges of Submarine Cable Repairs on an Increasingly Crowded Continental Shelf

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Abstract: The paper looks to draw out the existing and new challenges for both cable and marine operators as the number of stakeholders on this particular section of the worlds seabed starts to steadily increase; addressing not just the issues associated with offshore wind development, inter tidal generation, super grids but also future oil and gas infrastructure uptake/enhancement and the likely demand for space from wave energy and carbon capture and storage. The paper would also look to highlight the need for government organisations to acknowledge existing seabed tenants and their requirements prior to legislating and to encourage any prospective developers to engage with other seabed stakeholders as soon as practicable to ensure that the proposed infrastructure deployments do not compromise the safe operation and maintenance of the existing seabed users.

1. INTRODUCTION

Until relatively recently (early 1990's) there were a limited number of existing manmade subsea hazards i.e. cables and aggregate extraction zones and the only significant fixed and visible surface hazard that a cable ship captain would need to be concerned with were offshore oil and gas platforms and their associated subsea infrastructure. Well established route engineering principles kept submarine cables away from such structures/areas; unless there was a specific requirement for rig cable communications or a cable route required the crossing of a pipeline or another submarine cable, then the likelihood of such interactions were limited and well understood.

Figure 1 : Rig and Support Vessel

We can contrast this with the recent explosion of actual, planned and proposed marine offshore infrastructure:

- Offshore Wind-farms (OWF's).
- OWF's export cables.
- Grid and super grid connections.
- Scientific observatories.

- Fixed seismic arrays for oil and gas fields.
- Inter-tidal flow generation projects.
- Wave energy projects.
- Carbon capture and storage infrastructure.
- Deep sea mining.

All of the above but especially the increased spatial requirements associated with the existing and proposed renewables infrastructure (particularly on continental shelves) are potential game changers for future submarine cable installation and maintenance operations and present us with the opportunity to review established procedures, re-evaluate vessel resources and techniques and from a maintenance perspective increase the stakeholder collaboration pool to reduce costs. GMSL believes such collaboration is best evaluated and coordinated via membership of the established industry maintenance structures and cable protection committees.

As national governments or their representatives rush to regulate and/or exploit the envisaged maximum benefits from low carbon renewable energy or the revenues associated with license holders utilising the latest recovery techniques to extract more hydrocarbons from their existing fields; there is some concern that the traditional methods and access enjoyed by the telecommunications sector to repair their submarine cables maybe compromised.

Although the key focus and activity is presently centered on the continental shelf or Exclusive Economic Zone (EEZ), in deeper waters there are potential gains associated with harvesting various untapped mineral resources. In addition, there are a number of recent environmental challenges and initiatives from OSPAR (Oslo Paris Convention) to consider. Its recent publication (Guidelines on Best Environmental Practice in Cable Laying and Operation) [1] actively promotes caution where there is a lack of research data addressing the impacts associated with installing, operating and repairing submarine cable. There are also other None Government Organisations (NGO) led initiatives emanating from groups such as the World Wildlife Fund (WWF) and the Global Ocean Commission (GOC); which although initially appear to be focused on conservation concerns could easily evolve into regulatory measures that impact operations.

Figure 2 : OSPAR Regions

With some minor exceptions (usually permit based) the telecommunications industry has generally adopted their right to lay and repair cables under UNCLOS article's 51, 2 and 79, 2. [2] There is now a greater risk that some nation states could be persuaded by NGO's or renewable lobbyists without properly considering the economic criticality of submarine cables

and prioritise other developments over submarine cables or route their deployment to designated areas either using environmental concerns or spatial regulation.

UNCLOS (1982)

Article 51, 2: An archipelagic State shall respect existing submarine cables laid by other States and passing through its waters without making a landfall. An archipelagic State shall permit the maintenance and replacement of such cables upon receiving due notice of their location and the intention to repair or replace them.

Article 79, 2: ***Subject to its right to take reasonable measures for the exploration of the continental shelf, the exploitation of its natural resources*** *and the prevention, reduction and control of pollution from pipelines, the coastal State may not impede the laying or maintenance of such cables or pipelines.*

Article 79, 2: When laying submarine cables or pipelines, States shall have due regard to cables or pipelines already in position. In particular, possibilities of repairing existing cables or pipelines shall not be prejudiced.

This paper aims to highlight what GMSL as an active cable protection member and maintenance zone service provider believes are the important lessons learnt to date, particularly around advanced communication and stakeholder consultation so as to help avoid any unnecessary and expensive legal costs. It will also explore and highlight what the future holds from a marine maintenance perspective with respect to existing and future government regulatory output and ask whether the submarine cable industries existing trade structures are fully resourced and meshed to monitor and react to the increasing complex and diverse external environment.

Figure 3 : GMSL's CS Sovereign

2. INDUSTRY BACKGROUND

As stated earlier in this paper, this new complex environment, initially led by renewables has been steadily developing since the first wind farm was installed at Vindeby off the Danish coast in 1991. [3] It was nearly a decade later in December 2000 that the first UK wind-farm (Blyth offshore) was commissioned, [4] whilst the first Chinese wind farm; (Shanghai East Bridge) went into commercial operation in June 2010. [5] The first US offshore wind-farm at Block Island off the Rhode Island coast will be proceeding shortly. [6] These developments have all occurred in a relatively short space of time when compared with the 160 year old evolution of the submarine telecommunications industry.

Although the renewables industry is still very much in its infancy there have already been a number of disputes in European and US waters that highlight the previous benign operational environment for submarine cables has ended. There were disagreements off the UK and Dutch coasts in 2010 over the siting of wind turbines in proximity to existing submarine telecom cables. This became a significant issue

mainly because of the lack of regulatory and operational understanding about the required safe working distances for existing telecom cable repair vessels.

In the UK this ultimately lead to legal engagement by both the telecommunications and renewables companies involved, but resulted in more positive inter-industry dialogue at a trade body level. The outcome was a commitment to review both stakeholders' interests and ultimately the issuing of a collaborative industry guideline by Submarine Cables UK, Renewables UK, The Renewable Energy Association and the Crown Estate. [7] The guideline has been shared with all the regional cable protection committees the International Cable Protection Committee (ICPC) and any related industry organisations.

Figure 4 : Example of a Wind-farm Layout

The guidelines production was a herculean task. Its development exposed the gap between industry practices, experience levels, the lack of primary research material and any previous interaction between the sectors. It required the commissioning of an evidentiary desk top study led by the UK's Crown Estate [8] as a base document and it took nearly two years to reach a workable consensus and publish a guideline that addressed wind-farm and submarine telecom stakeholders concerns. Despite the work done, it does not tackle intertidal and offshore wave generation which adds greater complexity. Subsea infrastructure in these sectors has a greater seabed footprint than wind turbines and presents increased restrictions on cableship activity during repairs.

Picking up on the above data gaps, there is an ongoing dispute at Admiralty Inlet in the Puget Sound (Washington State) where a local utility company is seeking permission to install inter-tidal turbines in very close proximity (170m and 238m respectively) to an existing trans-Pacific submarine cable installation. As the North American Submarine Cable Association (NASCA) states in its submission to the Federal Energy Regulation Commission (FERC) [9], approval would set a troubling precedent going forward:

"The proposed separation distances significantly depart from industry guidelines and risk management practices in the unpredictable marine environment, and would pose unacceptable risks to cable integrity and maintenance operations. Marine activity to repair the telecom cables in close proximity to the turbine infrastructure could also put the turbine infrastructure at risk. Approval of the application would also set a troubling precedent going forward."

The most concerning issue with the above proposal is that like the earlier European dispute there is no primary research data available to evaluate exactly how the cable owner would repair their cable post turbine installation. While the earlier SCUK study dealt with fixed visible structures, this development is actually a new interaction scenario because the turbines will be submerged and therefore the risks faced by

the cables marine contractor are unknown and un-quantifiable without further study, modeling and trials.

In real terms, the new offshore environment is very much in its infancy and many other locations around the globe have yet to see this degree of negative stakeholder interaction. This should really be an advantage for the various international and national governments and NGO organisations, which should be able to learn from the body of work already undertaken in the UK, EU and US, thereby avoiding this type of conflict.

However one big question facing the submarine cable industry is how does it identify and reach out to all the new regulators and other interested stakeholders (particularly in areas where there are no regional cable protection committees) to make them aware that a developing body of knowledge is already in existence and to highlight that new industry interactions may require some research to fully understand what is and isn't feasible from an operations and maintenance perspective and looking to the future an installation perspective.

3. PLANNING LESSONS LEARNT

There is value in reviewing some of the key lessons learnt to date with respect to spatial and repair planning on the continental shelf to avoid delays by reducing the potential for negative interactions and the corresponding legal cost and effort that can result:

- Early stakeholder consultation at the outset of any new development is absolutely essential to avoiding disputes. Avoid any planning surprises!
- Any new development within one (1) nautical mile (1.85532km) of an existing seabed structure should be a trigger for engaging in dialogue with the impacted stakeholder.
- In national waters, encourage a proactive approach by the regulator or appropriate seabed owner/manager to facilitate early communication.
- Developers and/or installers should respect existing tenants' needs in particular with respect to future operational and maintenance requirements.
- Existing tenants should avoid a NIMBY approach (Not In My Back Yard) and be willing to enter into constructive dialogue with developers with the aim of finding a mutually beneficial solution. However if the existing tenants operation is compromised then the developer should be encouraged by the seabed authority/owner to re-consider its proposals prior to licensing.
- Cable owners should be willing to share data, knowledge or explain their views but accept that dialogue on a different approach to repairing cable assets may be required.
- If applicable, agree a repair framework or proximity agreement with the developer to govern future interactions either pre or post installation and where possible include a dispute resolution process using a neutral mediator.

- Acknowledge that the increasing complexity surrounding the repair theatre is likely to add costs throughout the supply chain and that compensation for the incumbent may be applicable if the ability to repair using established industry resources or practices is compromised.

- All stakeholders but regulators in particular, should familiarize themselves with the basics associated with vessel handling and operations with respect to the interaction they are engaging with and ruling on.

4. EXISTING AND FUTURE OPERATIONAL CONSTRAINTS

- In a number of geographical areas the increased seabed development has already impacted the ability of the contracted telecom cable repair vessel to work within established industry time lines and to complete a repair without formalised third party engagement/agreement between the submarine cable owner and the owner of the third party subsea asset.

- The number of complex and pre-planned interactions will become more common as the level of Continental shelf/EEZ development increases. This will increase the operational burden on all parties, but in particular the asset owners, who will need to ensure there is an agreed proximity/repair framework in place prior to any repairs commencing.

- In specific geographical locations there is a different level of vessel specification required for repairing telecommunication and renewable infrastructure. All stakeholders should be aware that such differences do exist and may need addressing in the future.

- There is a greater lease premium attributable to higher dynamic positioning specification vessels and that, depending on the type and level of development undertaken; established industry vessel specifications may need to be upgraded with the corresponding cost increase addressed.

- The operational distances agreed in SCUK guideline No 6 are supported by GMSL but for safety reasons are subject to master's discretion along with any undefined operational interactions.

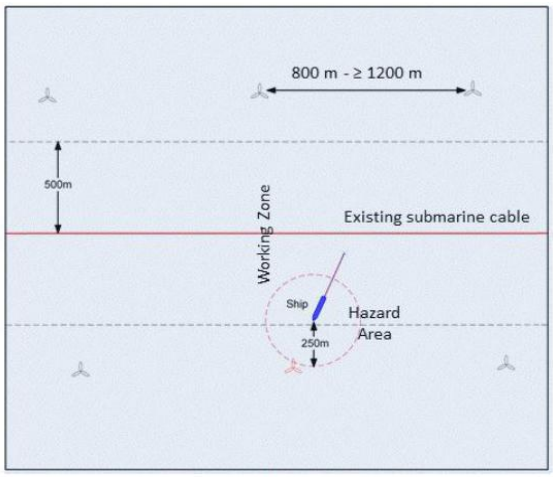

Figure 5 : Extract SCUK Guideline No 6 Figure Number 6

5. EXISTING INDUSTRY STRUCTURES AND FUTURE ENGAGEMENT

Existing submarine cable trade bodies such as the International Cable Protection Committee (ICPC), Submarine Cables UK (SCUK), Danish Cable Protection Committee (DKCPC), North American Submarine Cable Association (NASCA) and the Oceania Submarine Cable

Association (OSCA) have despite relatively low levels of funding compared to equivalent trade associations in other sectors been instrumental in protecting cable owners' interests during this period of rapid environmental change. They constitute a valuable body of knowledge and information from which all cable owners can benefit should they engage and interact via active membership.

Without doubt the level of engagement required to keep abreast of developments in the external environment is increasing whilst over the last decade most Telecom cable owners have seen reductions in operations and maintenance resources. To help offset this issue, a number of Cable Protection Committees are presently looking to increase subscriptions or introduce charges to allow the employment of full time resources. Although this means a significant percentage budgetary increase; not to do so would hamper the industry's ability to effectively engage and influence relevant national and international legislators, NGO's, lobbyists and other stakeholders in the challenging years ahead.

Looking to the future; if we are to continue enjoying the uninterruptable movement of information and power across international boundaries through the industries network of submarine cables and also effectively confront the risk of regulation drafted and approved without proper consultation, the industry should contemplate how we consolidate our body of knowledge to champion the cause.

Has the time come to re-visit the formal linking of the various national cable protection committees' with the international cable protection committee to promote a fully coordinated global approach to the many new developments and spatial challenges facing the industry? A proactive, effectively resourced approach could pay dividends later.

All industry stakeholders must plug the knowledge gap linking operations, maintenance and the space required to protect and repair their seabed assets. Is this something that is best left to a case by case basis under individual national jurisdictions (the present situation) or is there a desire for a pro-active international industry led solution to identify what's actually required and/or possible? This approach would enable productive engagement and possibly collaboration with international and national regulators.

6. CONCLUSIONS

The previously low interaction in a generally benign operational environment for marine activities in territorial waters, continental shelves and the EEZ is a rapidly disappearing modus operandi. All subsea asset owners need to acknowledge and plan for a more complex operational future.

There is a real danger that the present re-active approach to managing national regulatory output combined with a number of new and undefined operational interactions could lead to onerous regulatory precedents that could be avoided.

All cable asset owners need to continue to stress the strategic and economic value of the submarine cable industry and either individually or collectively through their trade organisations actively lobby national and international regulators/governments to ensure that their existing and future requirements with respect to access, asset security and route diversity continue to be met.

Given the number of on-going regulatory initiatives from individual nations within their EEZ and the stated aim of some NGO's to increase environmental protection in the marine environment, there is a real possibility that an attempt will be made to amend UNCLOS that will affect new and existing submarine cables. The industry should plan for just such an occurrence.

The existing trade organisations have done a sterling job protecting the rights of access and passage for the submarine cable industries to date, particularly under UNCLOS. However the increasing volume and pace of change may necessitate a meshing of their strategic aims and an increase in funding to tackle the complex regulatory work load.

The current lack of a single government regulatory body or a lead agency to represent submarine cables in many national jurisdictions makes effective industry stakeholder consultation very difficult.

7. REFERENCES

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